Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

416. *By Prof. W. P. Casey.*—"Given the base AB and the angle A of a triangle ABC; find the locus of the foot of the perpendicular CF drawn from C to the side of the inscribed square."

SOLUTION BY GEO. EASTWOOD.

Let $GHIJ$ denote the inscribed square, and let x, y be the coordinates of the point F, A being the origin. Put $AB = a$ and the tangent of the given angle $= t$; then is (K denoting the intersect. of CF produced with AB) $CK = tx$, $CF = tx—y$; and $\triangle ABC : \triangle GHC :: AB^2 : GH^2 (=FK^2)$, which gives $tx : tx—y :: a : y$, or $txy + ay — atx = 0$, which being of the form $Bxy + Dy + Ex = 0$, dentes a hyperbola whose asymptotes are represented by the equations $Bx + D = 0$, $By + E = 0$.

[For want of room, the solution of 417 is deferred to a future number.]

PROBLEMS.

418. *By Levi W. Meech, A. M., Norwich, Conn.*—Required to express Lagrange's Theorem in terms of Finite Differences, as far as practicable, instead of the usual differentials.

419. *By C. E. Everett, Spirit Lake, Iowa.*—Find the locus of a point starting from the centre of a given circle and moving so that the arc included between any two postions of the point shall equal the arc of the circle intercepted by the radii drawn through the same positions.

420. *By Prof. Asaph Hall.*—Transform the definite integral

$$\int_b^a \varphi(x).dx,$$

so that the limits of integration shall be m and n.

421. *By George Eastwood, Saxonville, Mass.*—In a Bicycle exercise on a level, circular course of given radius, what angle ought the plane of the machine to make with the vertical, so that the rider may move on the circumference of a perfect circle?

421. *By W. E. Heal, Marion, Indiana.*—Determine the most general form of two algebraic functions φ and θ such that

$$\varphi(x) + \varphi(y) = \varphi[\theta(x, y)],$$

or prove that there are no such functions.